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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

WAYMO LLC,

Plaintiff,

v.

UBER TECHNOLOGIES, INC., OTTOMOTTO LLC; OTTO TRUCKING LLC,

Defendants.

Case No. 3:17-cv-00939-WHA

DEFENDANTS UBER TECHNOLOGIES, INC. AND OTTOMOTTO LLC'S REBUTTAL CLAIM CONSTRUCTION BRIEF

Trial Date: October 10, 2017

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INTRODUCTION

Waymo does not argue that Uber literally infringes any claim of the '936 Patent. Instead, Waymo's infringement case rests on a single fragile principle—that a diode and a resistor are equivalent circuit elements. To head off any attempt by Waymo to confuse the jury with this erroneous purported equivalency, Uber proposes constructions of "diode" and "charging path" in accordance with their ordinary and customary meaning in view of the intrinsic record. Waymo's responses to Uber's constructions demonstrate that Waymo plans to press its beleaguered doctrine of equivalents argument by sleight of hand.

Uber's construction of "diode" explains the operation of this well-known circuit element in a straightforward way: A diode allows current to flow in one direction and prevents current from flowing in the reverse direction. Waymo disagrees and insists that any construction of "diode" reflect the concept of leakage current, which is not discussed anywhere in the intrinsic record and has no relevance to the embodiments disclosed in the specification of the '936 Patent. Waymo further distorts the significance of leakage current in its briefing to maintain its doctrine of equivalents argument—by analogizing a diode's tiny leakage current to current flowing through a resistor. But Uber's expert, Dr. Hobbs, explains that any leakage current in the '936 Patent would be about *a million times* smaller than forward current passing through the diode. Even Waymo's expert characterized leakage current being "about close to zero as anybody would care about." (Declaration of Michelle Yang ("Yang Decl.") Ex. 1 ("Wolfe Dep. Tr.") at 59:15-60:17.) Therefore, leakage current would not assist the jury in understanding how a diode works in the claimed circuit, and has no place in the construction of "diode."

Uber's construction of "charging path" clarifies that the "capacitor" in the claimed circuit is charged to a value higher than the voltage source. Uber provides unrebutted expert testimony to support its construction. Although Waymo disagrees with Uber's construction, Waymo's expert did not provide any testimony on this term because "[c]ounsel never asked me to." (Wolfe Dep. Tr. at 85:21-86:4.) Waymo instead relies on claim differentiation to argue that the "charging path" does not charge the capacitor to a value higher than the voltage source. But Waymo's identification of dependent claims, through the strategic use of ellipses, omits many

other limitations from those dependent claims that are not in Uber's construction, which nullifies Waymo's claim differentiation argument.

Finally, the term "wherein the capacitor is charged immediately following emission of a pulse of light from the light emitting element" is indefinite because a person of skill could not determine the scope of "immediately" with any particularity. Waymo argues that "wherein the capacitor is charged immediately" refers to when the capacitor *begins* to charge, even though the claims and specification use the term "immediately" to describe the amount of time it takes for the capacitor to *fully* charge. In any event, there is no way for a person of skill to determine the amount of time it takes for a capacitor to charge "immediately" with any degree of certainty.

LEGAL STANDARD

The construction of terms found in patent claims is a question of law to be determined by the court. *Markman v. Westview Instruments, Inc*., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). "[T]he interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim." *Phillips v. AWH Corp*., 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) (quoting *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)); s*ee also MySpace, Inc. v. GraphOn Corp.*, 672 F.3d 1250, 1256 (Fed. Cir. 2012) (when construing claims, courts must consider "what was invented, and what exactly was claimed."). The "correct construction," therefore, is one that "stays true to the claim language and most naturally aligns with the patent's description of the invention." *Renishaw*, 158 F.3d at 1250.

While the words of a claim are generally given their "ordinary and customary meaning," *Phillips*, 415 F.3d at 1312-13, the court must construe a term when the "meaning of a claim term as understood by persons of skill in the art is not readily apparent" or "[w]hen the parties present a fundamental dispute regarding the scope of a claim term." *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1360, 1362 (Fed. Cir. 2008). Importantly, "[a] determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." *Id.* at 1361. The court must

"ensure that questions of the scope of the patent claims are not left to the jury." *Every Penny Counts, Inc. v. Am. Express Co*., 563 F.3d 1378, 1383 (Fed. Cir. 2009).

"The claims, of course, do not stand alone" and instead "must be read in view of the specification," which is "[u]sually . . . dispositive" and "the single best guide to the meaning of a disputed term." *Phillips*, 415 F.3d at 1315 (internal quotations omitted). The "claims, when read in light of the specification and the prosecution history, must provide objective boundaries for those of skill in the art." *Interval Licensing Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370-71 (Fed. Cir. 2014). The definiteness standard requires "clear notice of what is claimed, thereby appris[ing] the public of what is still open to them." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014) (internal quotations omitted). A patent is invalid for indefiniteness if its claims, read in light of the patent specification and file history, fail to inform with reasonable certainty those skilled in the art about the scope of the invention. *Id*. The definiteness standard must avoid an innovation-discouraging "'zone of uncertainty.'" *Id*. (internal quotations omitted).

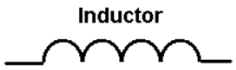
BACKGROUND

A. Building a Step-Up Circuit with Basic Circuit Components Is Well Known

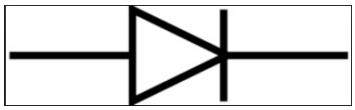
U.S. Patent No. 9,368,936 (the "'936 Patent") discloses a step-up circuit for firing a laser diode, using well-known circuit elements like inductors, diodes, and capacitors. Below is a brief overview of the circuit elements.

An inductor stores and releases energy from a magnetic field of the inductor's coil. As current through the inductor increases, the inductor converts some of the current to energy and stores it in the magnetic field. (Expert Report of Dr. Philip Hobbs on Claim Construction ("Hobbs Rep.") ¶¶ 24-25.) As current through the inductor decreases, the inductor converts any energy stored in the magnetic field of the coil back to current that flows out of the inductor. (*Id*.) The common circuit symbol for an inductor is:[1]

[1] This symbol is also sometimes used to denote a ferrite bead (FB), a related but distinct electronic component used to suppress high-frequency noise in electronic circuits.



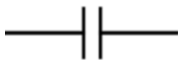
The role of a diode within a circuit is to allow current to flow in one direction and prevent current from flowing in the opposite direction. (*Id.* ¶ 26.) The symbol for a semiconductor diode is:



A diode is a two-terminal device that typically includes an anode and a cathode. (*Id.* ¶ 29.) When a voltage is applied to the diode, the diode either can allow current to flow through it (indicated by the direction of the triangle in the above symbol), or can block any current from flowing through it (indicated by the vertical line of the symbol), depending on the polarity of the voltage. (*Id.* ¶¶ 28-31.) When the diode is forward biased (*i.e.*, the voltage on the anode is greater than the voltage on the cathode), the diode will act as a conductor and current can flow through it. When the diode is reverse biased (*i.e.*, the voltage on the anode is less than the voltage on the cathode), the diode will block the flow of current through it. (*Id.*)

Ideally, the diode will only allow current to flow when the diode is forward biased and prevent any current flow when the diode is reverse biased. (*Id.* ¶ 32.) In reality, a small and negligible current can flow through the diode even when the diode is reverse biased. (*Id.*) This is referred to as leakage current. (*Id.*) Generally, the magnitude of the current that flows through the diode when it is forward biased is on the order of a million to a billion times greater than the magnitude of the leakage current. (*Id.*) Because it is so miniscule, especially when compared to the flow of current when the diode is forward biased, the leakage current of a diode does not play a role in the operation of a circuit. Persons of skill generally do not consider leakage current when using a diode in a circuit. (*Id.*)

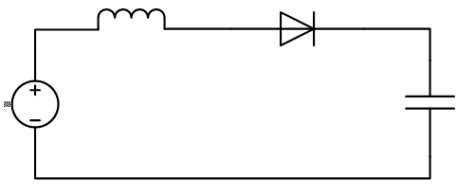
The role of a capacitor in a circuit is to store charge. (*Id* ¶ 33.) The symbol for a capacitor is:



A capacitor typically includes two metal plates separated by a dielectric material. (*Id* ¶ 34.) Current flows into one of the metal plates and creates an electric field. (*Id*.) Positive charge will collect on one plate, while a negative charge will collect on the other plate. (*Id*.) This electrical field allows a capacitor to store charge. (*Id*.)

A particular arrangement of an inductor, diode, and capacitor can create a step-up circuit. (*Id* ¶ 35.) A step-up circuit stores more voltage in the capacitor than a voltage source powering the circuit, so that the circuit can provide more charge to an element than can be provided by the voltage source. (*Id*.)

An example step-up circuit, in charging mode, with a voltage source, inductor, diode, and capacitor is:



(*Id* ¶ 36.)

The step-up circuit can "supercharge" the capacitor by charging the capacitor to a voltage greater than the voltage source. (*Id* at ¶¶ 36-38.) When the circuit is initially activated, current will flow from the voltage source to the inductor. (*Id*.) The inductor converts the initial current to energy and stores the energy in its magnetic field. (*Id*.) Once the inductor's magnetic field becomes saturated, the current from the voltage source flows through the inductor to the diode. (*Id*.) At this point, since the voltage on the anode of the diode is greater than the cathode, the diode allows the current to pass and flow through the inductor to the capacitor. (*Id*.) As the capacitor fills up with charge, its voltage will approach the voltage of the voltage source. (*Id*.) When the voltage on the capacitor equals the voltage of the voltage source, the current through the circuit begins to decrease. (*Id*.) In response to the decreasing current, the inductor will release the energy stored in its magnetic field, which will flow to the capacitor via the diode (which is still forward biased). (*Id*.) This extra current to the capacitor will cause the voltage of the capacitor to exceed the voltage of the voltage source. (*Id*.) When this happens, the voltage on

the cathode of the diode will become greater than the voltage of the anode, causing the diode to become reverse biased, thereby preventing the flow of current through the exemplary step-up circuit. (*Id.*) When the diode becomes reverse biased, the charge on the capacitor will become "trapped," meaning that the capacitor will now hold and maintain a charge that is greater than the voltage of the voltage source. (*Id.*) In this way, the voltage is "stepped-up," resulting in a greater voltage stored on the capacitor.

The step-up circuit discussed above is a conventional circuit that has been developed and employed in various applications for decades. As an example, U.S. Patent 4,648,093 to Sasnett (Yang Decl. Ex. 2 ("Sasnett")), filed over 30 years ago, discloses a step-up circuit in a laser diode firing system. FIG. 2 of Sasnett (reproduced below with annotations) includes the same voltage source, inductor, diode, and capacitor step-up circuit described above.

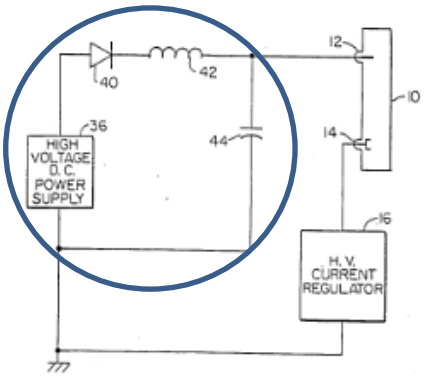


FIG. 2.

Sasnett describes a circuit that is configured to "supercharge" capacitor 44 so that the stored charge can be made available to a gas discharge laser 10, thereby causing the laser to emit light. Sasnett describes the operation of the step-up circuit, explaining that "*capacitor 44 is charged to a potential equal to the potential across inductor 42 plus the potential of high voltage DC power supply 36*. Diode 40 prevents discharge of capacitor 44 into high voltage DC power supply 36 when capacitor 44 is charged above a potential equal to that of high voltage DC power supply 36." (Sasnett at 5:49-63 (emphasis added).)

B. The '936 Patent Discloses a Step-Up Circuit

The '936 Patent is generally directed to a laser diode firing system in a LIDAR device. The laser diode firing system disclosed in the '936 Patent, when triggered, delivers a pulse of

electrical current to a laser diode. (Hobbs Rep. ¶ 42.) To deliver the pulse, the circuit described in the '936 Patent employs a step-up circuit to charge a storage capacitor that is subsequently discharged into the laser diode during a discharge process. (*Id.*)

FIG. 5A (reproduced below) illustrates the laser diode firing system of the '936 Patent:

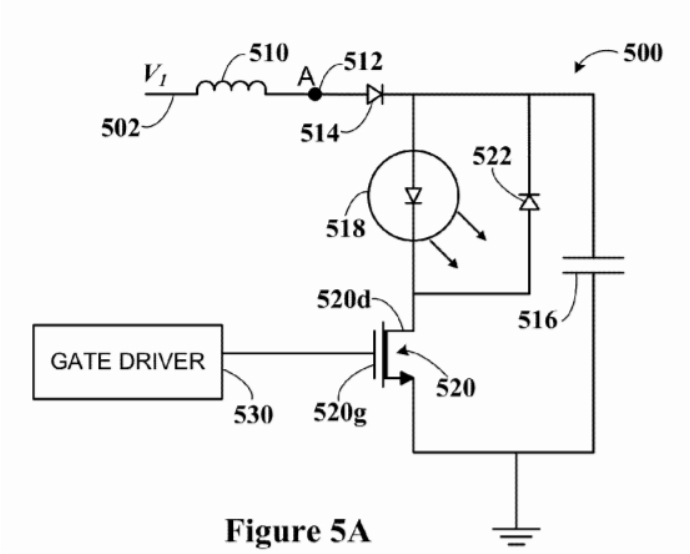


Figure 5A

Fig. 5A includes a voltage source 502 in series with an inductor 510, a diode 514, and a capacitor 516, just like the step-up circuits known in the prior art. The circuit also includes a transistor 520 that acts like a switch. (Hobbs Rep. ¶ 44.) When turned on and off, transistor 520 toggles the configuration of the circuit between a charging configuration and a discharging configuration. (*Id.*)

When the circuit is in the charging configuration, it utilizes the step-up circuit to charge capacitor 516 to a voltage that exceeds the voltage source 502. The current from voltage source 502 enters the inductor 510, which stores the current as energy in a magnetic field. Over time, the voltage across the capacitor will become approximately equal to the voltage source 502, as the capacitor stores the charge flowing from the voltage source. As the voltage of the capacitor 516 approaches the voltage of voltage source 502, the inductor will release its stored energy, which will then flow as current into the capacitor, thereby supercharging it.

Once capacitor 516 is charged to a value higher than voltage source 502, the capacitor will

seek to discharge and send current back to voltage source 502. But diode 514 prevents this discharge so that capacitor 516 can maintain its supercharged state. Diode 514 becomes reverse biased at the point when capacitor 516 would seek to discharge its excess current back to voltage source 502. The '936 patent states: "The diode 514 is forward biased (and thus allows the capacitor 516 to charge) when the voltage at node A 512 is greater than the voltage on the capacitor 516." ('936 patent at 18:35-40). "Upon the diode 514 being reverse biased, the current through the inductor 510 goes to zero and the voltage across the inductor 510 settles at zero, which sets node A to the voltage of the voltage source 502 (e.g., the voltage V_1), *but the capacitor 516 may hold a higher voltage (e.g., about 2 V_1)*." (*Id* at 18:62-67 (emphasis added).)

ARGUMENT

A. The Court Should Construe "Diode" and "Charging Path" Because the Parties Dispute Their Meaning

It is appropriate for courts to engage in claim construction when "the parties present a fundamental dispute regarding the scope of a claim term." *O2 Micro*, 521 F.3d at 1362. "A determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." *Id*. at 1361.

Although Waymo argues that the Court should not construe either "diode" or "charging path," Waymo also disagrees with Uber's proposed constructions of those terms. Waymo disagrees with Uber's construction of "diode" for requiring "the flow of current in one direction only" and its expert proffers an alternative construction of "conduct[ing] electricity much more easily in one direction that in the other." (Dkt. 1116-1, ¶ 59.) Waymo also disagrees with Uber's construction of "charging path," arguing that it should mean "a path for charging," (Pl. Waymo's Opening Claim Constr. Br. (Dkt. No. 1116) ("Br.") at 15:27-28) and not require that the charging path be "configured to charge the capacitor to a voltage higher than the supply voltage," as in Uber's construction. (Br. at 17:10-20.) But Waymo cannot simultaneously dispute Uber's construction and also argue that the terms need not be construed. Thus, because the parties dispute the meaning of "diode" and "charging path," the Court should construe both terms. *Every*

Penny Counts, 563 F.3d at 1383 ("[T]the court must see to it that disputes concerning the scope of the patent claims are fully resolved.").

Waymo repeatedly cites *Thorner v. Sony Computer Entertainment America LLC*, 669 F.3d 1362 (Fed. Cir. 2012) to argue that the Court need not construe "diode" or "charging circuit." (Br. at 2:15-21, 13:10-16, 16:5-8.) But *Thorner* does not hold that claim terms cannot be construed, but instead restates the well-known canon of claim construction: terms "are generally given their ordinary and customary meaning as understood by a person of ordinary skill in the art when read in the context of the specification and prosecution history." *Thorner*, 669 F.3d at 1365. This is exactly the standard that Uber follows in its claim construction arguments below.

Moreover, in *Trustees of Columbia University in City of New York. v. Symantec Corp.*, 811 F.3d 1359 (Fed. Cir. 2016), the Federal Circuit rejected the argument Waymo advances here, stating: "Our case law does not require explicit redefinition or disavowal . . . . The specification is *always* highly relevant to the claim construction analysis, and is, in fact, the single best guide to the meaning of a disputed term." *Trustees*, 811 F.3d at 1363 (internal quotations and citation omitted, emphasis in original). The Federal Circuit continued:

> [T]he claims . . . do not stand alone. Rather they are part of a fully integrated written instrument, consisting principally of a specification that concludes with the claims . . . . The only meaning that matters in claim construction is the meaning in the context of the patent. . . . . [¶] Thus, we reject [patentee's] argument that the presumption of plain and ordinary meaning can be overcome in only two circumstances: [when] the patentee has *expressly* defined a term or has *expressly* disavowed the full scope of the claim in the specification and the prosecution history. As our en banc opinion in *Phillips* made clear, a claim term may be clearly redefined without an explicit statement of redefinition and even when guidance is not provided in explicit definitional format, the specification may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents.

Id. at 1363-64 (internal quotations and citations omitted).

B. "diode"

Uber's Construction	Dr. Wolfe's Construction	Waymo's Construction
"a two-terminal electronic device that allows the flow of current in one direction only" [2] (Claims 1, 9, and 17)	"a two-terminal electronic device that will conduct electricity much more easily in one direction than in the other"	Plain meaning

Uber's construction of "diode" specifies that a diode "allows the flow of current in one direction only." Waymo disagrees because a tiny amount of leakage current exists when a diode is reverse biased. The main issue for the Court to decide is whether the construction of "diode" must take into account this miniscule leakage current.

1. The '936 Patent describes the claimed "diode" as allowing the flow of current in one direction only.

The purpose of the diode in the '936 Patent is to allow the flow of current in one direction only. The claims recite that the "diode" is part of a "charging path" that charges a "capacitor" (*see* claim 1: "the charging path includes…the diode…[and] the capacitor is configured to charge via the charging path."). Fig. 5C, reproduced below, shows diode 514 as part of the charging path for capacitor 516:

[2] Uber revises its proposed construction of "diode" to address arguments raised by Waymo, for the first time, in its opening brief. Although the parties previously met and conferred on July 24, 2017, Waymo did not identify any part of Uber's constructions with which it disagreed at that time.

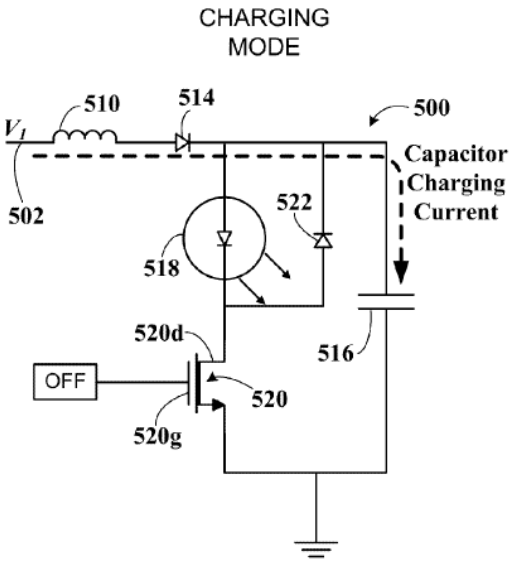


Figure 5C

The specification of the '936 Patent explains: "the diode 514 regulates the voltage applied to the capacitor 516." ('936 patent at 18:32-35.) When the voltage at capacitor 516 is less than the voltage source 502, diode 514 is forward biased and allows current to flow along the charging path to charge capacitor 516. (*Id*. at 5:9-12; 18:35-37.) When capacitor 516 charges to a level higher than voltage source 502, then diode 514 becomes reverse biased "to thereby *prevent* the capacitor from discharging." (*Id*. 5:12-16 (emphasis added).) The specification further states: "Upon the diode 514 being reverse biased, the current through the inductor 510 *goes to zero* and the voltage across inductor 510 *settles at zero*." (*Id*. at 18:62-64 (emphasis added).) A person of skill would understand that reverse-biased diode 514 blocks current flowing backwards, thereby causing the zeroing of inductor 510's current and voltage. (Hobbs Rep. ¶ 59.)

At his deposition, Waymo's expert admitted that the specification discloses that diode 514, in its reverse-biased state, blocks current from flowing in the reverse direction:

> Because the voltage is very low, ***for a practical sense, it's blocked. That's the patentee's language***, not mine I'm just repeating it. But that's what "blocked" means in that sense, is that it's reversed biased because we're near the zero point and there's little or no current that's flowing.

(Wolfe Dep. Tr. at 108:2-17 (emphasis added).) Accordingly, the intrinsic record, as admitted by

Waymo's expert, discloses that the diode "allows the flow of current in one direction only," in accordance with Uber's construction.

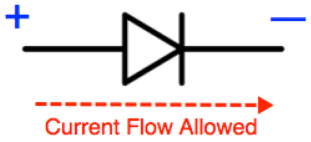
2. Waymo's insistence on including leakage current in the construction of "diode" is unnecessary and confusing.

Waymo faults Uber's construction of "diode" for not giving credence to leakage current—a tiny amount of current that leaks through when a diode is reverse biased. (Br. at 14:20-15:9.) Uber's construction does not reference leakage current because (i) leakage current is not mentioned in the '936 Patent, and (ii) practically, leakage current is so small that it would have no effect on the claimed circuit of the '936 Patent. As explained by Dr. Hobbs, current flowing through a forward-biased laser diode is generally at least ***a million times*** greater than leakage current through the diode in a reverse-biased state. (Hobbs Rep. ¶¶ 32, 62.)

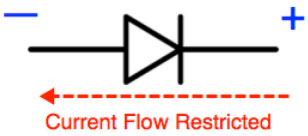
At his deposition, Waymo's expert admitted on multiple occasions that that the leakage current of a diode is very small.

- "[T]he words 'reversed biased' tell us that it exists' but we're right up against the null point in that particular situation that's being described there. So *the current is about close to zero as anybody would care about*." (Wolfe Dep. Tr. at 60:13-17 (emphasis added);
- Leakage current is "generally *several orders of magnitude less* than the maximum forward current of the diode." (*Id*. at 58:7-13);
- "[I]f we were to be hyper technical bit there would be a *very very small reverse current,* but it's right up against the point where it would be zero. (*Id*. at 60:7-10 (emphasis added).)

Despite the insignificance of leakage current, and the fact that it is never referenced in the '936 Patent, Waymo expends significant amount of effort explaining the concept of leakage current in its briefing, including with its misleading demonstratives. For example, one of Waymo's demonstratives, reproduced below, shows a forward-biased state of a diode with current, shown in a dotted red line, allowed to flow in the forward direction:



Waymo's second demonstrative shows a reverse-biased diode using the same dotted red line, except with the arrow pointing in the reverse direction.



Waymo's use of the same dotted red line misleads the reader into believing that the leakage current, which Waymo's own expert admits is miniscule, is somehow equivalent or even on the same scale as the free flow of current in the forward direction

The reason why Waymo emphasizes the existence of leakage current—even though it is of no consequence to the operation of the circuit claimed in the '936 Patent—is to advance its infringement argument under the doctrine of equivalents. Waymo will argue that diodes allow current to flow in both directions, just like resistors, and therefore, diodes and resistors are equivalent. Thus, Waymo will argue that an attribute of diodes that is insignificant and irrelevant to the operation of the claimed circuit is the basis for concluding that a diode is insubstantially different from a resistor. Including the notion of leakage current in a construction of "diode" is unnecessary and likely to cause jury confusion.

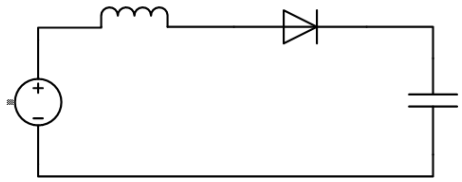
C. "charging path"

Uber's Construction	Waymo's Construction
"a path allowing current to flow from the inductor to the capacitor, the path configured to charge the capacitor to a voltage higher than the supply voltage" (Claims 1, 9, and 17)	Plain meaning

1. The intrinsic record demonstrates that the "charging path" is part of a step-up circuit.

As explained in Dr. Hobbs' declaration and as set forth below, a person of skill would understand that the claimed "charging path" requires that it "charge the capacitor to a voltage higher than the supply voltage" in view of the intrinsic record. Waymo has no expert opinion to the contrary, because it never asked its expert to provide such an opinion on this particular topic. (Wolfe Dep. Tr. at 85:21-86:4.)

The claims recite a configuration of circuit elements that result in a step-up circuit. For example, claim 1 recites "a voltage source," "an inductor coupled to the voltage source," "a diode coupled to the voltage source via the inductor," and a "capacitor coupled to a charging path…wherein the charging path includes the inductor and the diode." A person of skill would draw the claimed arrangement of circuit elements as:



This is the same configuration of the step-up circuit described above in the background section. (Hobbs Rep. ¶ 69.) Independent claim 1 further describes the operation of the claimed circuit in a manner consistent with a step-up circuit: "responsive to the transistor being turned off, the capacitor is configured to charge via the charging path such a voltage across the capacitor increases from a lower voltage to a higher voltage and the inductor is configured to release energy stored in the magnetic field such that a current through the inductor decreases from a higher current level to a lower current level." The additional release of energy from the claimed "inductor" causes the supercharging of the "capacitor," as in a step-up circuit. Because the claims require that the "charging path" include an inductor that releases energy stored in the magnetic field and that the charging path increases the voltage level on the capacitor, one of skill in the art would conclude that the recited "charging path" is a step-up circuit. (*Id* ¶¶ 67-73.)

The specification of the '936 patent is consistent with interpreting the term "charging path"

as a step-up circuit. The specification discloses that the voltage source, inductor, diode, and capacitor are in series—the same configuration as a step-up circuit. (*Id.* ¶ 74.)

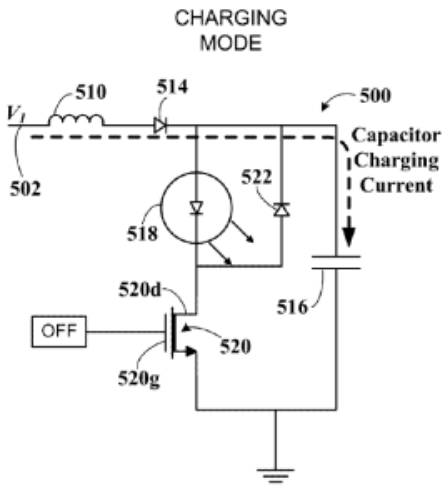


Figure 5C

The specification also explicitly states that the configuration is that of a step-up circuit, whereby the capacitor is supercharged by the energy released from the inductor. The '936 Patent explains: "At block 654, the capacitor is charged from energy released by the inductor" ('936 Patent at 26:35-36); "[t]he diode 514 and inductor 510 can thus combine to cause the capacitor 516 to be charged to a voltage that exceeds the voltage V_1 of the voltage source 502." (*Id.* at 21:40-42.) The specification goes on to disclose that during the charging mode, "the diode 514 is forward biased when the voltage across the capacitor 516 is a lower level, such as between time times [sic] T_{off} and T_2 as shown in FIG. 5b when the capacitor voltage V_{cap} charges from less than V1 to about 2V1." (*Id* at 21:42-46.)

FIG. 5B (reproduced below, with annotations) also illustrates that the circuit is configured to cause the voltage across the storage capacitor (Vcap) to exceed the voltage of the power supply. (Hobbs Rep. ¶ 75.) As shown in the figure, Vcap (the voltage across the capacitor) is charged to $2V_1$, which is twice the voltage of the source.

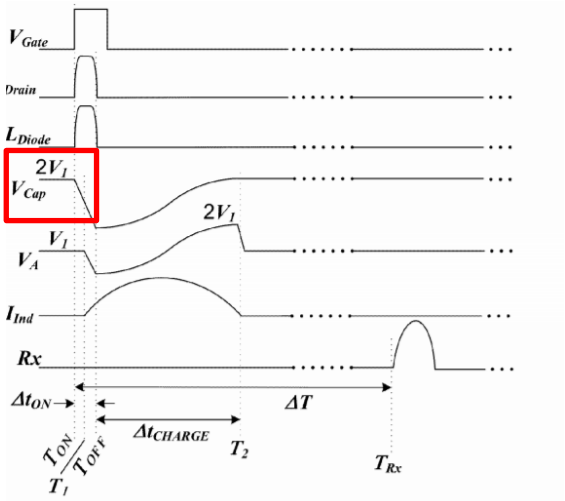


Figure 5B

Because the claims of the '936 Patent describe circuit elements in the configuration of a step-up circuit, which is confirmed by the specification, the proper construction of the term "charging path" should include "charg[ing] the capacitor to a voltage higher than the supply voltage."

2. Waymo's reliance on claim differentiation fails because Uber's construction does not render the dependent claims superfluous.

The doctrine of claim differentiation does not apply, unless the construction would render a dependent claim superfluous. *SRAM Corp. v. AD-II Eng'g, Inc.*, 465 F.3d 1351, 1358 (Fed. Cir. 2006). In other words, when the "dependent claims contain additional limitations that do not fall within the scope of the independent claims," the "dependent claims are not rendered superfluous by the Court's construction" and claim differentiation does not apply. *Adobe Sys. Inc. v. Wowza Media Sys.*, No. 11-CV-02243-JST, 2014 WL 709865, at *12 (N.D. Cal. Feb. 23, 2014); *see also EPL Holdings, LLC v. Apple, Inc.*, No. 12-CV-04306-JST, 2014 WL 491270, at *4 (N.D. Cal. Feb. 4, 2014).

Waymo argues that Uber's construction of "charging path" is improper because certain dependent claims already include the requirement of charging the "capacitor to a voltage higher than the supply voltage." (Br. at 16:11-20.) To make its point, Waymo uses the following table

comparing Uber's construction with dependent claim 4:

Defendants' Proposed Construction of "charging path"	**Dependent Claim 4 of the '936 Patent**
"a path allowing current to flow from the inductor to the capacitor, the path configured to charge the capacitor ***to a voltage higher than the supply voltage***" (emphasis added)	"4. The apparatus of claim 1, ***wherein the higher voltage level is greater than a voltage of the voltage source***, ..." (emphasis added)

Waymo's ellipsis omits the majority of the language of dependent claim 4 (shown in underlining below), including the limitations of "an anode" and "a cathode" that Waymo argues[3] are not required in independent claim 1:

> 4. The apparatus of claim 1, wherein the higher voltage level is greater than a voltage of the voltage source, and wherein the diode has an anode coupled to the voltage source via the inductor and a cathode coupled to the capacitor, such that the diode is forward biased when the voltage across the capacitor is at the lower voltage level and the diode is reverse biased when the voltage across the capacitor is at the higher voltage level.

Waymo's ellipses notwithstanding, dependent claim 4 includes limitations that are not in Uber's construction of independent claim 1. Dependent claim 4 therefore would not be rendered superfluous by Uber's construction and cannot support Waymo's claim differentiation argument. Moreover, asserted independent claim 17 does not have a claim that depends from it that specifies that a capacitor is charged to a level higher than the voltage source. Thus, Waymo's claim differentiation arguments would not apply to independent claim 17.

Regardless, as discussed above, Uber's construction of "charging path" results from the intrinsic evidence, which overcomes any presumption of claim differentiation. *See Kraft Foods, Inc. v. Int'l Trading Co.*, 203 F.3d 1362, 1368 (Fed. Cir. 2000).

Waymo cites *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898 (Fed. Cir. 2004) to

[3] On page 14 fn1 of its opening brief, Waymo argued that the specification did not require that the claimed "diode" included an anode and a cathode. Uber subsequently revised its construction to remove the requirement of those limitations. Now, neither party's construction of "diode" requires that it include an anode and cathode.

support its claim differentiation argument, but this case is inapposite. In *Liebel-Falrsheim*, the court found that "the only significant distinction" between the independent and dependent claims was the use in the dependent claims of a pressure jacket, which "undermines [defendant's] contention that all of the claims of the [asserted] patents require the presence of a pressure jacket." *Liebel-Flarsheim* at 910. This case differs because there are several significant distinctions between independent claim 1 and dependent claim 4 of the '936 Patent, including, as discussed above, limitations that are not in Uber's construction of independent claim 1.

Waymo also cites to *Hill-Rom Services, Inc. v. Stryker Corp*., 755 F.3d 1367 (Fed. Cir. 2014) to argue that Uber's construction limits the claims to a specific embodiment. (Br. at 17:10-20.) This is incorrect because Uber's construction is consistent with how a person of skill would understand the claimed "charging path" in view of the intrinsic record, as explained in Dr. Hobbs' declaration. Dr. Hobbs' opinion is unrebutted, as Waymo never asked its expert to provide such an opinion on this particular topic. (Wolfe Dep. Tr. at 85:21-86:4.) And because the term "charging path" is not a term of art, this is a case where "meaning of a claim term as understood by persons of skill in the art is not readily apparent" and the court should construe the term consistent with the intrinsic record and how one of ordinary skill in the art would understand its meaning. *O2 Micro Int'l Ltd*., 521 F.3d at 1362.

D. "wherein the capacitor is charged immediately following emission of a pulse of light from the light emitting element"

The Supreme Court heightened the standard for evaluating indefiniteness such that it is no longer "sufficient that a court can ascribe some meaning to a patent's claims." *Nautilus*, 134 S. Ct. at 2130. Instead, a patent must give "clear notice of what is claimed, thereby apprising the public of what is still open to them." *Id*. at 2129 (citations and internal quotation marks omitted). Accordingly, "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Id*. at 2124; *see also Interval Licensing LLC v. AOL, Inc*., 766 F.3d 1364, 1371 (Fed. Cir. 2014) ("a term of degree fails to provide sufficient notice of its scope if it depends on the unpredictable vagaries of any one person's opinion.")

(internal citations omitted).

The term "wherein the capacitor is charged immediately following emission of a pulse of light from the light emitting element," as recited in dependent claims 3, 11, and 19, is indefinite because a person of skill would not be able to determine, with reasonable certainty, when a capacitor is or is not "charged immediately."

A person of skill would understand that the claim term describes a capacitor being *fully* charged immediately after laser emission ("the capacitor *is* charged…"). (Hobbs Rep. ¶ 79.) This is confirmed by the specification, which describes "a capacitor recharging interval Δt_{CHARGE}" that allows the capacitor to fully charge 500 nanoseconds after the laser discharge completes:

> As shown in FIG. 5B, a capacitor recharging interval Δt_{CHARGE} begins at the transistor turn off time T_{OFF} and ends with the reverse biasing of the diode 514, at time T2. *The capacitor recharging interval Δt_{CHARGE} may be approximately 500 nanoseconds*, for example. Moreover, by configuring the firing circuit 500 such that the capacitor 516 is recharged immediately following a pulse emission, the firing circuit 500 can be recharged and ready to emit a subsequent pulse faster than an alternative configuration."

('936 Patent at 21:55-64 (emphasis added).) Therefore, "the capacitor is charged immediately" limitation refers to Δt_{CHARGE}, the total amount of time required to charge the capacitor. (Hobbs Rep. ¶ 80.)

A person of skill, however, could not determine whether a given capacitor fully charges immediately. Even if a Δt_{CHARGE} time of 500 nanoseconds constituted an immediate recharge, "the edges of the claim are murkier." *Core Wireless Licensing S.A.R.L. v. Apple Inc*, No. 15-CV-05008-PSG, 2016 WL 3124614, at *12 (N.D. Cal. June 3, 2016). For example, a person of skill could not determine if 501, 550, or 1,000 nanoseconds would fall within the scope of "immediately." (Hobbs Rep. ¶ 82.)

Waymo argues that "wherein the capacitor is charged immediately following emission of a pulse of light from the light emitting element" refers to the transition between the discharge cycle and charge cycle. (Br. at 18:11-13.) But, as discussed above, a person of skill would understand that the term refers not only to the transition period after emission, but also to the amount of time it takes to completely charge the capacitor. Because a person of skill would not

understand the boundaries of "immediately" charging a capacitor with any degree of certainty, the claim is indefinite.

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